Distribution of Cleft Lip and Palate at Cleft Lip and Palate Center Medical Faculty, Universitas Muhammadiyah Malang, Indonesia

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Abstract

Cleft lip and palate (CLP) and cleft palate (CP)are a common head and neck hereditary deformity. The high number of cases has prompted the Medical Faculty, Universitas Muhammadiyah Malang to start community service by providing free surgery to repair cleft lip and palate (Cleft Lip and Palate Center Medical Faculty of Universitas Muhammadiyah Malang (CLP MFUMM)).

Purpose: To find the distribution of cases from the year of surgery, sex, side of CL/P, cleft palate (CP), hospital where the surgery was performed and parent education level in CLP MFUMM, from 2019 until 2020.

Patients and Methods: Two hundred and five consecutive cleft lip subjects, with or without palates, and cleft palate attending CLP MFUMM from 2019 until 2020 were studied.

Results: The most surgeries done is at the year of 2019 (69%). Most of the patients were male (55%). CL/P were the most frequent cases (94%). Complete cleft found mostly in male patient with left unilateral cleft (23%), while incomplete cleft found mostly in female patient also with left unilateral cleft (7%). The palate involvement found mostly in soft palate only and female patients (46%). The surgeries were mostly performed at RSI Aisyiyah Malang (60%). The education level of the parents is mostly elementary school (father 36%, mother 34%).

Conclusion: CL/P were the most frequent. Complete cleft mostly in male patient with left unilateral cleft, while incomplete cleft mostly in female patient also with left unilateral cleft. The cleft palate was mostly soft palate only and female patients.

Keywords: *Cleft lip with or without palate, cleft palate, sex, side of cleft*

Introduction

Orofacial cleft non-syndromic-cleft lip, cleft lip and palate, cleft palate, and lip and oral cavity deformity is the most common head and neck hereditary deformity.[1]

Cleft lip (CL) is defined as a congenital deformity that occurs in the primary palate anterior to the incisor foramen. It can be unilateral, bilateral, complete or incomplete. Cleft palate (CP) is defined as a congenital deformity, occurs in the secondary palate (soft palate and hard palate). Cleft lip with or without cleft palate (CL/P) can be found in 1/1000 birth with multiple causes.[2]Some causes that have been identified are environment causes (geographically and socioeconomically) and genetic factor.[3]

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The high number of cases has prompted the Medical Faculty, Universitas Muhammadiyah Malang to start community service by providing free surgery to repair cleft lip and palate. This community service is called Cleft Lip and Palate Center Medical Faculty of Universitas Muhammadiyah Malang (CLP MFUMM) and it's been established since 2008. CLP MFUMM is a non-profit organization that provides integrated services for cleft lip and palate patients from the age of 0 until adult. This center help patients received the appropriate medical assistance from a specialized team of doctor. The number of operation that we accomplish as of today is approximately 2500 cases. Most of our patient comes from East Java and the surrounding area.

From all of those cases, this study aims to find the distribution of year of surgery, sex, side of CL/P, cleft palate (CP), hospital where the surgery was performed and education level parents in CLP MFUMM, from 2019 until 2020.

Material and Methods

The study reviewed 205 consecutive cleft patients with no recognized associated syndromes, who were seen at the CLP MFUMM from 2019 until 2020. All files were retrieved from the records department. All files were retrieved from the records department. Before the subjects is included in the study, they are given information and had to have full knowledge about the study. They are also have to provide a written consent, in accordance with the ethical principles governing medical research and human subjects, as laid down in the Helsinki Declaration (2002 version, available at: http://www.wma.net/e/policy/b3.htm). The data were treated with absolute confidentiality.

All subjects were examined by a specialized doctor from the plastic surgery department, specializing in craniofacial surgery. Physical examination and radiologic imaging of the anatomic structures involved were recorded. Education level of the parents were also queried.

Subjects were group into male and female patients, which then divided more into CLP, CL/P and CP. The groups is then further divided into complete and incomplete cleft for CLP and CL/P group, while the CP groups is further divided into soft palate only and with hard palate involvement.

Results

All 205 cases were included in the study. The most surgeries done is at the year of 2019 (69%, Figure 1). Most of the patients were male (55%, Figure 2). The cleft distribution showed that CL/P was the most frequent cases (94%, Figure 3). The distribution of complete cleft was mostly in male patient with left unilateral cleft (23%, Figure 4), while the distribution of incomplete cleft was mostly in female patient also with left unilateral cleft (7%, Figure 4). The distribution of palate involvement is mostly soft palate only and female patients (46%, Figure 5). The surgeries were mostly performed at RSI Aisyiyah Malang (60%, Figure 6). The education level of the parents is mostly elementary school (father 36%, mother 34%, Figure 7).

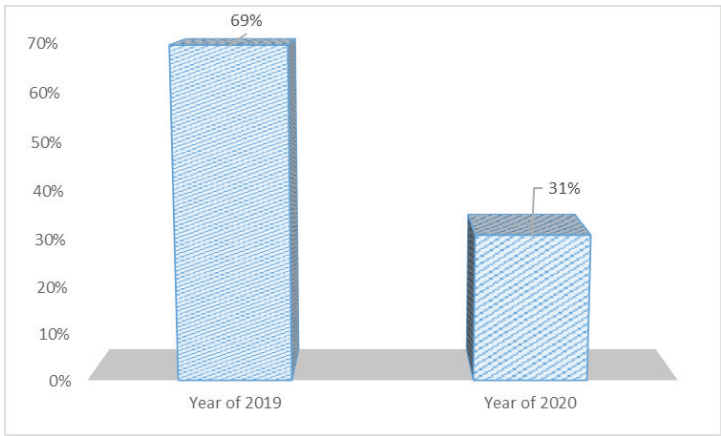


Figure 1 Distribution of the number of surgeries by year.

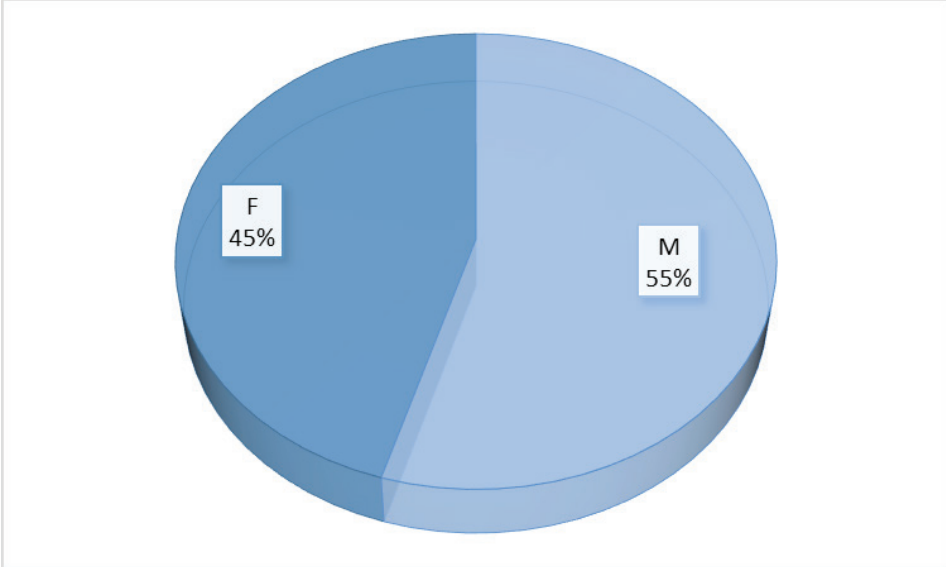


Figure 2 Distribution by Sex.

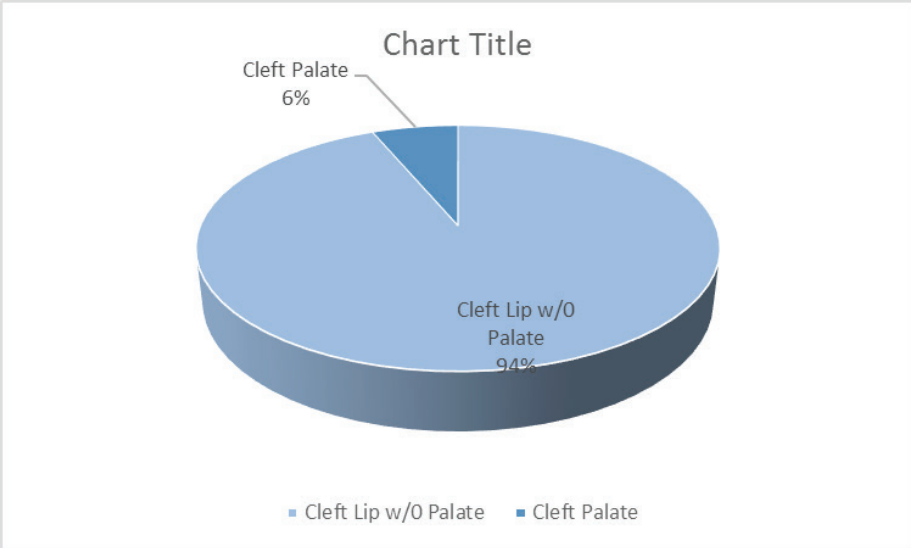
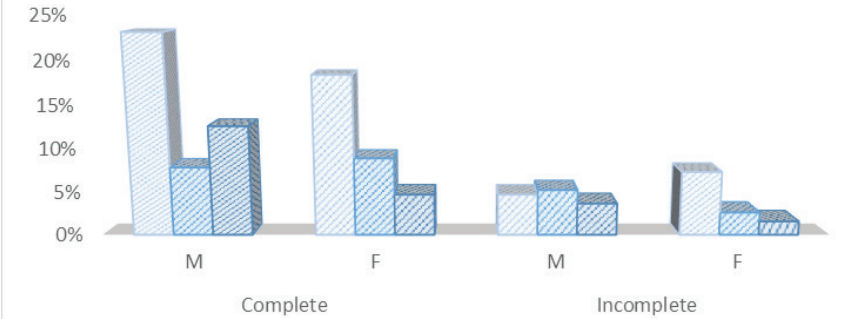
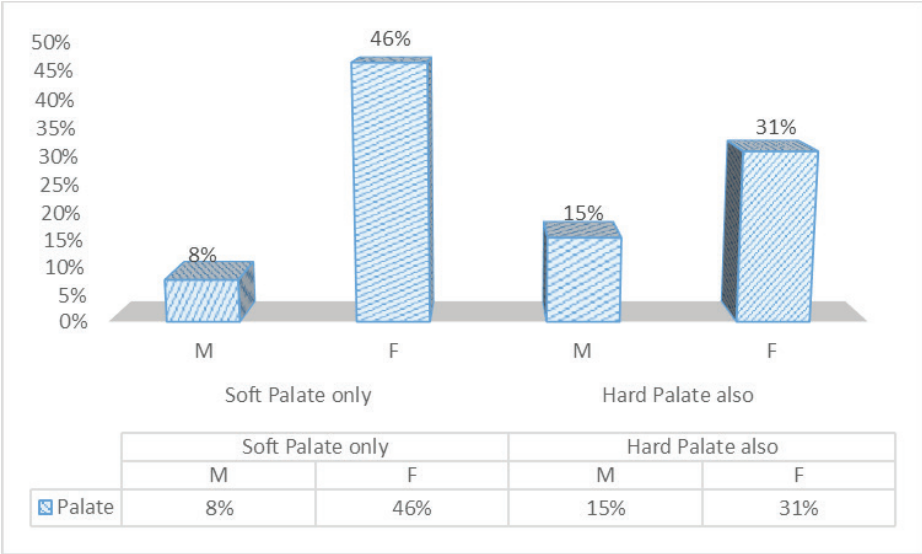


Figure 3 Distribution of cleft.



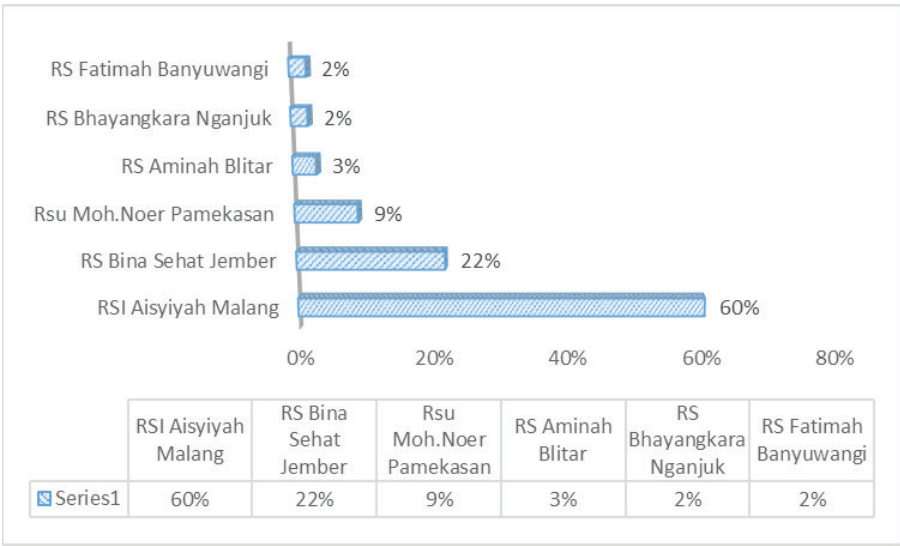
	Complete		Incomplete	
	M	F	M	F
Left Unilateral	23%	18%	5%	7%
Right Unilateral	8%	9%	5%	3%
Bilateral	13%	5%	4%	2%

Figure 4 Distribution of cleft lip with/without palate by sex and type.



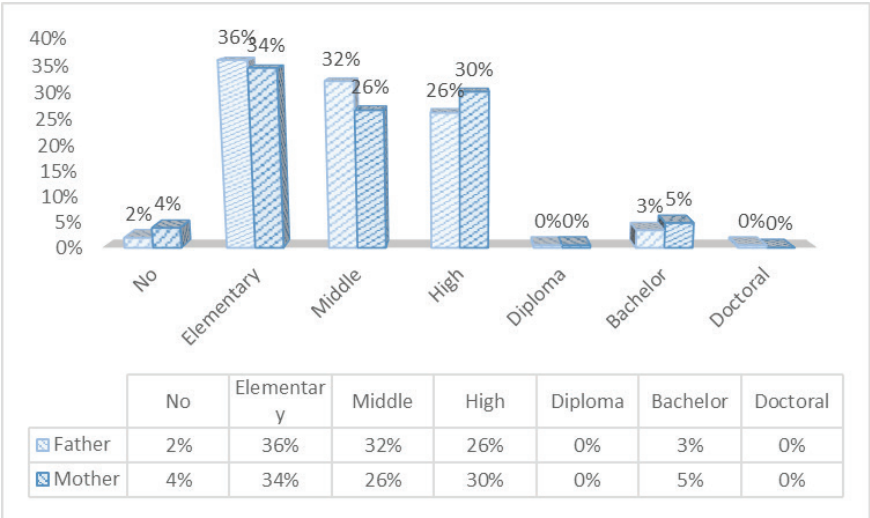
	Soft Palate only		Hard Palate also	
	M	F	M	F
Palate	8%	46%	15%	31%

Figure 5 Distribution of cleft palate only by sex and type.



	RSI Aisyiyah Malang	RS Bina Sehat Jember	Rsu Moh.Noer Pamekasan	RS Aminah Blitar	RS Bhayangkara Nganjuk	RS Fatimah Banyuwangi
Series1	60%	22%	9%	3%	2%	2%

Figure 6 Distribution of the hospital where the surgery was performed.



	No	Elementary	Middle	High	Diploma	Bachelor	Doctoral
Father	2%	36%	32%	26%	0%	3%	0%
Mother	4%	34%	26%	30%	0%	5%	0%

Figure 7 Distribution of education level patient's parents.

Table 1. Distribution of the number of surgeries by year

Year	Number	%
Year of 2019	142	69
Year of 2020	63	31

Table2 Distribution by Sex.

	Male	Female
Number	112	93
%	45	55

Table3 Distribution of cleft.

	Total	%
Cleft Lip w/o Palate	192	94
Cleft Palate	13	6

Table 4: Distribution of cleft lip with/without palate by sex and type.

	Complete				Incomplete				%Total
	M	%	F	%	M	%	F	%	
Left Unilateral	44	23	35	18	9	5	14	7	53%
Right Unilateral	15	8	17	9	10	5	5	3	25%
Bilateral	24	13	9	5	7	4	3	2	22%

Table 5: Distribution of cleft palate only by sex and type.

	Soft Palate only				Hard Palate also			
	M	%	F	%	M	%	F	%
Palate	1	8	6	46	2	15	4	31

Table 6: Distribution of the hospital where the surgery was performed.

Hospital	Number of surgery	%
RSI Aisyiyah Malang	124	60%
RS Bina SehatJember	45	22%
RSUMoh.NoerPamekasan	19	9
RS Aminah Blitar	7	3
RS BhayangkaraNganjuk	5	2
RS Fatimah Banyuwangi	5	2

Table7 Distribution of education level patient's parents.

	Father	%	Mother	%
No	4	2	8	4
Elementary	73	36	70	34
Middle	65	32	54	26
High	53	26	61	30
Diploma	1	0	1	0
Bachelor	7	3	10	5
Doctoral	1	0	0	0

Notes:

Abbreviations:CL/P: cleft lip or without cleft palate; CLP MFUMM: Cleft Lip and Palate Center Medical Faculty of UniversitasMuhammadiyah Malang; CLP: cleft lip and palate; CP: cleft palate.

Discussion

The number of operations carried out in 2019 more than doubled from 2020. This can be understood due to the pandemic conditions in 2020 which forced all elective operations to be postponed and reduced. However, efforts have been made as much as possible to meet the required health protocols, so that cleft lip and palate repair surgery could be carried out.

Male patients outnumber female patients. Most of the CL / P patients were male, while the majority of CP patients were female. This finding is in line with a study conducted in Mexico for 10 years (1990 to 1999) which found CLP and CL patients were predominantly male, whereas CP patients were predominantly female.[4] Based on race, men have more cleft lip and palate than women by a ratio of 2: 1. Cleft lip with or without cleft palate is most common in men, and cleft palate occurs most frequently isolated in women, across various ethnic groups.[5,6]

CL/P have the highest number of cases at 94% (193 patients), followed by CP at 6% (13 patients). This

findings is consistent with Mossey and Little 2002 which found that CL and CLP have the high number of cases in Latin America and Asia but lower in Israel, South Africa and South Europe.[5] One possibility is that the parents do not know that their child has a cleft palate.[7]

The largest number of patients was left-sided complete unilateral CL/P male patients. Both patient unilateral CL/P left side or the right side were more men than women. Patients with bilateral CL / P are more common in men, and most have complete cleft. This is consistent with previous research, which states that unilateral cleft was most common compared to bilateral cleft with a ratio of 9: 1 and were twice as prevalent on the left side as compared to the right. On the other hand, bilateral cleft occur most frequently on the left side rather than the right side with a ratio of 6: 3: 1.[6] Although the mechanism is unclear, the observation that slower development of the facial artery on the left may be a contributing factor.[8] Different examination methods may have a greater effect on an isolated cleft palate than in a cleft lip with or without a cleft palate, because the cleft palate is less visible externally.[5]

The most common cleft pattern in this study found were left unilateral cleft at 53%, followed by right unilateral cleft at 25% and bilateral cleft at 22%. Study in Mexico and Philippines found the same results, with the most common cleft pattern found are left unilateral cleft, followed by right unilateral cleft and bilateral cleft.[9,10] According to a research in Spain, the unilateral complete cleft lip and palate (54.4%) was most frequently found, followed by the bilateral complete cleft lip and palate (16.3%).[11]

The hospital where the operation is carried out largely conducted in RSI Aisyiyah Malang, the rest scattered in several cities across East Java, Indonesia. These operations get the largest donation from the non-profit Smile Train foundation, which is based in New York.

This study found most of the parent education level is elementary school and live in Malang city. Education of expectant mothers about behavior before and during pregnancy, which can increase the risk of oral cleft is very important. This may lead to a decrease in the incidence of oral cleft and improve the local health system, but lack of information and lack of public education may have a major impact on oral cleft. Increase parental knowledge about risk factors and potential risk factors that cause cleft lip and palate can be very useful in prevention.[12]

Conclusion

During 2019-2020 CLP MFUMM has performed 205 surgeries for lip repair and palate repair. The number of surgical activities in 2020 is only half that of 2019, due to pandemic constraints. the number of male patients is more than female patients. The majority of patients with CL / P are men, while the majority of patients with CP are women. Most of the cases handled by CLP MFUMM are CL / P. The highest number is unilateral CL / P cases left side of male patients. For both left and right-side unilateral CL / P cases, men outnumbered women. Bilateral CL / P cases are more common in men, and most are complete. Most of the surgeries were carried out at RSI Aisyiyah Malang. Most parent education is elementary school.

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References

1. Ahmed MK, Bui AH, Taioli E. Epidemiology of Cleft Lip and Palate. In: Almasri MA, editor. Designing Strategies for Cleft Lip and Palate Care [Internet]. InTech; 2017 [cited 2020 Dec 5]. Available from: http://www.intechopen.com/books/designing-strategies-for-cleft-lip-and-palate-care/epidemiology-of-cleft-lip-and-palate
2. Gonseth S, Shaw GM, Roy R, Segal MR, Asrani K, Rine J, et al. Epigenomic profiling of newborns with isolated orofacial clefts reveals widespread DNA methylation changes and implicates metastable epiallele regions in disease risk. Epigenetics. 2019 Feb 1;14(2):198–213.
3. Leslie EJ, Carlson JC, Shaffer JR, Feingold E, Wehby G, Laurie CA, et al. A multi-ethnic genome-

wide association study identifies novel loci for non-syndromic cleft lip with or without cleft palate on 2p24.2, 17q23 and 19q13. Hum Mol Genet. 2016 Mar 30;ddw104.

4. Blanco-Davila F. Incidence of cleft lip and palate in the northeast of Mexico: a 10-year study. J Craniofac Surg. 2003;14(4):533–7.
5. Mossey PA, Little J, Munger RG, Dixon MJ, Shaw WC. Cleft lip and palate. The Lancet. 2009;374(9703):1773–85.
6. Kati FA. Cleft Lip And Palate: Review Article. WJPMR. 2019 Feb;10.
7. Ibarra-Lopez JJ, Duarte P, Antonio-Vejar V, Calderon-Aranda ES, Huerta-Beristain G, Flores-Alfaro E, et al. Maternal C677T MTHFR Polymorphism and Environmental Factors Are Associated With Cleft Lip and Palate in a Mexican Population. J Investig Med. 2013 Aug 1;61(6):1030–5.
8. Shkoukani MA, Chen M, Vong A. Cleft lip–a comprehensive review. Front Pediatr. 2013;1:53.
9. Murray JC, Daack-Hirsch S, Buetow KH, Munger R, Espina L, Paglinawan N, et al. Clinical and Epidemiologic Studies of Cleft up and Palate in the Philippines. Cleft Palate Craniofac J. 1997;34(1):7–10.
10. Watkins SE, Meyer RE, Strauss RP, Aylsworth AS. Classification, Epidemiology, and Genetics of Orofacial Clefts. Clin Plast Surg. 2014 Apr;41(2):149–63.
11. Yáñez-Vico R-M, Iglesias-Linares A, Gómez-Mendo I, Torres-Lagares D, González-Moles M-Á, Gutierrez-Pérez J-L, et al. A descriptive epidemiologic study of cleft lip and palate in Spain. Oral Surg Oral Med Oral Pathol Oral Radiol. 2012 Nov;114(5):S1–4.
12. Kawalec A, Nelke K, Pawlas K, Gerber H. Risk factors involved in orofacial cleft predisposition – review. Open Med [Internet]. 2015 Feb 5 [cited 2020 Dec 5];10(1). Available from: https://www.degruyter.com/view/journals/med/open-issue/article-10.1515-med-2015-0027/article-10.1515-med-2015-0027.xml